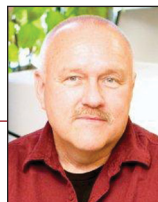


From the Editor



Space: The Final Frontier

I, like many Trekkies of my generation, have been fascinated with the Space Race and all that it has brought to scientific discovery. From the flights of Yuri Gagarin and Alan Shepard in 1961 (yes, I was around back then!), watching the first walk on the moon by Neil Armstrong, to extended stays of 6 months or more by astronauts on the International Space Station (ISS), space exploration has led to the improvement and development of numerous products used in our everyday life including microwave ovens, cold weather wear, digital cameras, memory foam, Velcro, and more. MSA has long recognized the importance of microscopy to the space program having hosted astronauts Al Worden (Cleveland, 1997) and Donald Pettit (Portland, 2015) at Microscopy & Microanalysis meetings.

In the mid to late 1990s, I was fortunate to be part of a team at the University of South Carolina to have several experiments fly on the space shuttles. This opportunity allowed us to examine cell:cell and cell:ECM structure and interactions of cardiovascular fibroblasts and myocytes under zero gravity. Cells were plated in a laboratory at the Kennedy Space Center, transferred to the shuttle, and maintained in culture while in space. When cells were returned to Earth, I had the privilege of imaging them by confocal microscopy to determine if there were structural differences when compared to control cells grown in the presence of gravity. A highlight of my career was being present for the launch of the STS-95 Discovery mission in 1998, and to have one of our experiments handled by John Glenn when he returned to space on the Discovery.

And now, not even 25 years later, a scanning electron microscope (SEM) capable of elemental analysis is available for research on the ISS. The Voxa Mochii™ is fully operational in space and being used to image academic, commercial, and NASA samples. In the past, microscopic analysis required sending samples back to laboratories on Earth, which caused significant delays in identification of problems including failure analysis. Having an SEM aboard the ISS now provides elemental analysis and nano-imaging in low Earth orbit while supporting microgravity and engineering research. More information about Mochii™ on the ISS can be found at: The Mochii ISS National Laboratory — Voxa and Mochii Space Vehicle & Crew Safety — Voxa. Microscopy is indeed playing a role in conquering the final frontier!

Publication Objective: to provide information of interest to microscopists.

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Editorial Staff

Robert L. Price, *Editor-in-Chief*
bob.price@uscmed.sc.edu
(803) 216-3824

Gennifer Levey, *Production Manager*
glevey@meridianartpro.com
(212) 780-0315

Beverly Maleeff, *Administrative Editor*
bev@alumni.psu.edu

Charles E. Lyman, *Senior Editor*
charles.lyman@lehigh.edu

Phil Oshel, *Senior Editor*
oshel1pe@cmich.edu

Stephen Carmichael, *Columnist*
carmichael.stephen@mayo.edu

John Shields, *Columnist*
johnshields59@gmail.com

Cameron Varano, *Pioneers Editor*
cameron.varano@gmail.com

Richard Edelmann, *Education Editor*
edelmare@miamioh.edu

Deb Kelly, *Microscopy 101 Editor*
debkelly@psu.edu

Rich Fiore, *Product and Industry News Editor*
rich@scifisalesinc.com

Rich Martens, *Calendar Editor*
rmartens@ues.com

Nikolaus Cordes, *Digital Content Editor*
nikolaus.cordes@inl.gov

Thomas Kelly, *Chief Innovation Judge*
thomas.kelly@steaminstruments.com

Robert Simmons, *Chief Micrograph Judge*
robert.simmons@briarwillow.com

Advertising Sales

M.J. Mrvica Associates, Inc.
2 West Taunton Avenue, Berlin, NJ 08009
mjmrvica@mrvica.com
(856) 768-9360

Kelly Miller, *Account Manager*
kmiller@mrvica.com

Magazine website:

<http://www.microscopy-today.com>

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Publisher

Cambridge University Press
One Liberty Plaza, 20th Floor
New York, New York 10006
(212) 337-5000

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